4-27-2004

Short Range Laser Based Distancing Circuit with Transimpedance Sensor

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by

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April 27, 2004

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ABSTRACT

On an automated manufacturing line different objects are sometimes run through on the same line. This is done to save time and money in engineering, testing, and maintenance that a new line entails, however, there is a problem by doing this in that there is no efficient way to count the number of each of the different parts that have been run through a line. This report specifies a way to recognize the different objects by measuring the distance between the sensor and the object; however, the circuit discussed in the report does not complete the counting of each object.

The research involved IEEE articles and books along with much experimentation. The IEEE articles and books gave the equations, terminology, and offered some circuit interface insights that were utilized throughout the duration of the project. Experimentation was conducted on the position relationship between the laser and the sensor, the effect of ambient light falling on the sensor, and the intricacies of interfacing a digital integrated circuit into an analog circuit without using a digital to analog converter.

The conclusions from the project are as follows. In order for the circuit to have maximum stability, it should be enclosed in a dark area such as a control box that could be mounted on a manufacturing line. The circuit has a range of about ten inches to where it is most accurate. Finally, the laser and photodiode must be placed within two inches of each other in order to function properly.

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